

Trend Study 6-7-01

Study site name: Crandall Canyon.

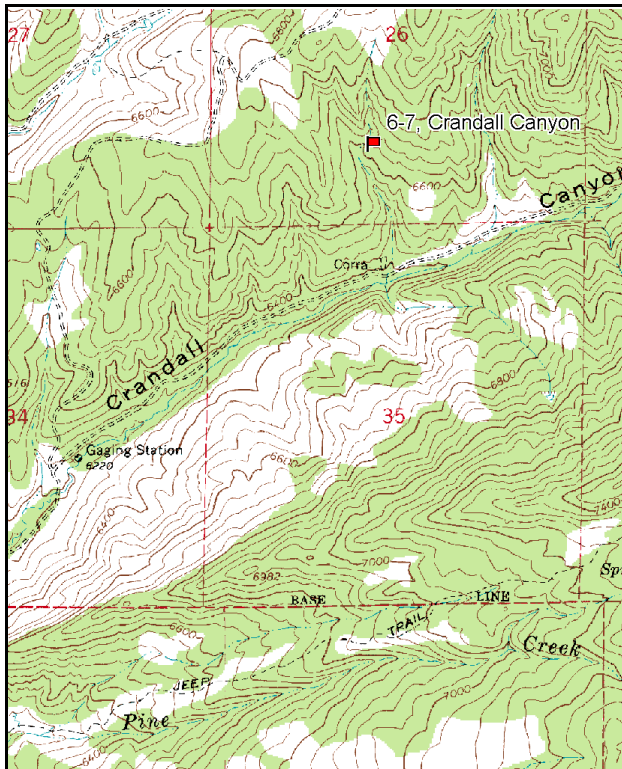
Vegetation type: Mountain Brush.

Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: Line 1 (11, 31, & 71ft), line 2 (59 & 95ft).

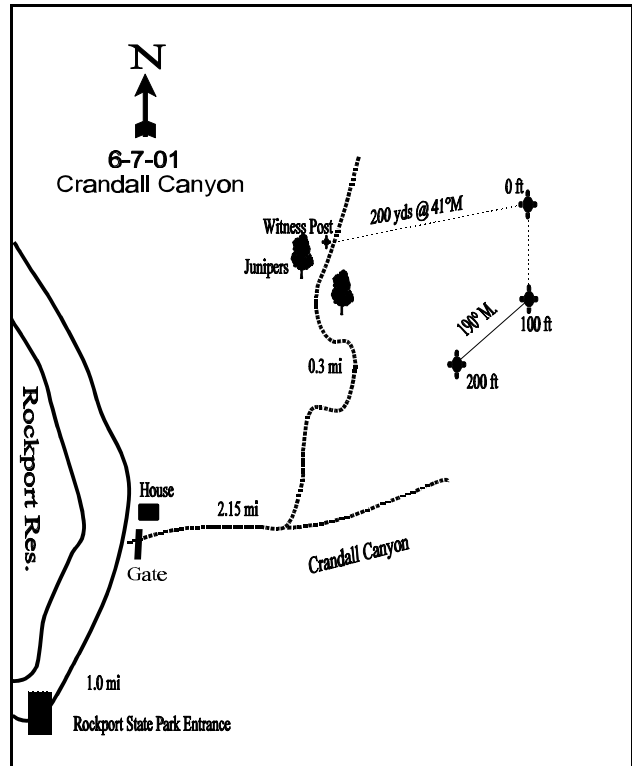
LOCATION DESCRIPTION

From the guard house at Rockport State Park, proceed north and east on the paved road for 1.0 mile. Turn right, proceed up through the gate and up Crandall Canyon (dirt road) for 2.15 miles, and turn left at the fork. Travel 0.3 miles north on this road to a pair of junipers on either side of the road. Just past the junipers on the left hand side of the road is a witness post. From the witness post walk approximately 200 yards at 41 degrees magnetic to the 0-foot stake of the baseline. The 0-foot stake is marked by browse tag #7956. The 200-foot baseline doglegs and runs 190 degrees magnetic.



Map Name: Crandall Canyon

Township 1N, Range 5E, Section 26



Diagrammatic Sketch

UTM 4514925 N 470499 E

DISCUSSION

Trend Study No. 6-7

The Crandall Canyon study is located on critical deer and elk winter range at approximately 6,640 feet in elevation. The site lies on a moderately steep (35%), southwest-facing slope. The plant community in this area is best described as mixed mountain brush that varies from mountain big sagebrush-grass to areas nearly dominated by Gambel oak. The result is a mosaic vegetative pattern that provides excellent big game habitat. Crandall Canyon is entirely private land and is intensively grazed by sheep and cattle. Deer, elk, and moose must therefore compete for available forage. The intensity of use tends to be heavy, and one or more of previous listed animal species is usually on the site at all times of the year. All classes of vegetation have shown impacts of grazing or browsing over the life of this transect. A pellet group transect read on the site in 2001 estimated 50 deer days use/acre (122 ddu/ha), 2 elk days use/acre (5 edu/ha), and 7 cow days use/acre (16 cdu/ha).

Soil texture on this site is classified as sandy clay loam. The soil reaction is moderately alkaline (8.0 pH). Phosphorus is low at 5.1 ppm, as values less than 10 ppm can be limiting to normal plant growth and development. The soil profile is moderately rocky throughout, appears well-drained, and seems to have good growth potential. Some erosion is apparent with pedestalling around some of the plants on the site. Amount of bare soil is quite high at 31% in 1996 and 41% in 2001. An erosion condition class assessment estimated slight soil erosion in 2001. Gullies appear easily formed, but many of them show signs of healing. Most of the area has been utilized heavily enough to adversely effect plant and litter cover, especially when associated with periods of drought. Sheet and gully erosion has been unacceptably high in the past, but appears to have been stabilizing in recent years. The ratio of the nested frequency of bare soil to protective ground cover (vegetation, litter, and cryptogams) was low at 1:2.4 in 1996 and 1:2.2 in 2001. A grazing system needs to be implemented that will allow for long-term improvements in soil condition and herbaceous vegetative cover.

The majority of the vegetation on the site is composed of a diverse mixture of mountain brush species. Twelve species have been sampled on the site with the principal species being true mountain mahogany, mountain snowberry, Gambel oak, serviceberry, mountain big sagebrush, and bitterbrush. Increaser shrubs include broom snakeweed, stickleaf low rabbitbrush, and prickly pear cactus. Of the increaser species, only broom snakeweed comprises a substantial portion of the composition, making up 17% of the browse cover in 2001. The estimated density of two species, serviceberry and mountain big sagebrush, is much lower in 1996 and 2001 compared to the 1984 and 1990 readings. Both of these species have discontinuous, clumped distributions, and much of the change in density is due to the much larger sample implemented prior to the 1996 reading. In 1990, percent decadence and poor vigor were high in the populations of serviceberry, mountain big sagebrush, mountain mahogany, and snowberry. In 1996 and 2001 however, percent decadence and vigor have shown considerable improvement for all of these species. The principal species receive moderate to heavy use and appear to have stable populations. In 2001, the highest level of use was observed on mountain mahogany with 80% of the plants showing heavy use. Consistent heavy browsing on mahogany has resulted in the population being short in stature. Average leader growth on mahogany was less than 2 inches in 2001. Pocket gopher and badger diggings around plants were noted in the past, as was a moderate rust infestation on serviceberry plants. This disease does not usually kill plants, but can effect vigor.

The herbaceous understory is quite sparse for a mountain brush community. Forbs are insignificant providing only 3% average cover in 1996 and 2001. Grasses have contributed an average of 11% cover in 1996 and 2001, with perennial species providing nearly all of it. Thickspike wheatgrass, bluebunch wheatgrass, and Indian ricegrass are the most abundant perennial grasses on the site. Two annuals, cheatgrass and Japanese brome, are present, but infrequent. Both of these annual bromes have remained at low frequencies since 1996.

1984 APPARENT TREND ASSESSMENT

In spite of rather heavy big game and livestock use, this area does not appear to have a sharply declining trend. Range condition may be changing slightly downward, and if so, the rate is relatively slow. With respect to soil, there is little empirical evidence to suggest that the erosion rate is increasing. A more subjective view reveals the presence of active gullies in the area and signs of ongoing sheet erosion. Both of these observations suggest a declining soil trend. Vegetatively, the data are inconclusive. Broom snakeweed, an aggressive and undesirable increaser shrub, appears to be becoming more abundant. Both the old line intercept and Interagency studies document this. Perennial grasses may be increasing slightly in density and species diversity. This observation is somewhat tentative but if confirmed, could eventually have a detrimental effect on shrub reproduction. Utilization, especially of browse, appears to be heavier now than in 1977. Forage production appears to have remained stable since 1977. There are some very tentative clues to suggest that there may be declining populations of mountain big sagebrush and true mountain mahogany.

1990 TREND ASSESSMENT

The mixed mountain brush community on this privately-owned winter range still provides good big game habitat, although conditions have deteriorated for some species since 1984. Photo-point comparisons depict a loss of sagebrush cover and production. This is shown in the data by an increase in the percentage of decadent plants (71%), and heavier hedging. Density is slightly higher. Sagebrush canopy cover averages only 5%. The data also illustrates a slight decline in true mountain mahogany density and the loss of mature plants resulting in 88% decadence. Vigor is poor on these heavily hedged shrubs. Oakbrush, low rabbitbrush, and snakeweed increased in several, but not all measured parameters. Thickspike wheatgrass increased significantly. The nested frequency of Indian ricegrass is almost unchanged, while that of bluebunch wheatgrass was significantly lower. Forbs are relatively insignificant. The amount of litter cover decreased, percent bare ground increased, leaving the rocky soil more vulnerable to erosion.

TREND ASSESSMENT

soil - down (1)

browse - downward (1)

herbaceous understory - stable (3)

1996 TREND ASSESSMENT

Since the extended drought from 1987 to 1990, there have been some signs of recovery. Percent bare ground has decreased to 31%, and percent litter cover has also slowly increased. The gullies around the site show signs of healing. Soil trend for this site appears to be improving at this time. The overall browse trend for the site is improving except for mountain big sagebrush which now only provides 4% of the browse cover. This species seems to have reached its lowest density with almost 29% being classified as dead. With continued normal precipitation patterns this would be expected to turn around in the future. The best description for the herbaceous understory trend would be stable. Many of the species have changed either up or down, but overall it has remained basically stable for perennial species.

TREND ASSESSMENT

soil - slightly up (4)

browse - slightly up (4)

herbaceous understory - stable (3)

2001 TREND ASSESSMENT

Trend for soil is slightly down. Litter cover decreased with a corresponding increase in bare ground. Vegetative cover remained nearly stable, but the majority of the vegetative cover comes from browse which is not as effective at holding soils in place as herbaceous species. Trend for browse is stable. The principal species remain at stable densities. Percent decadency increased in the populations of mountain big sagebrush and mountain mahogany, but current levels are within acceptable limits for these species. Use remains moderate to heavy on true mountain mahogany, serviceberry, and mountain big sagebrush. Recruitment from young plants is low for big sagebrush and mahogany, but moderately high for serviceberry and snowberry. Trend for the herbaceous understory is stable. Nested frequency for thickspike, bluebunch wheatgrass, and Indian ricegrass declined, but not significantly. Sum of nested frequency for all perennial grass and forb species declined by 12% in 2001. However, this decline is not enough to warrant a downward trend at this time. Further decreases in perennial herbaceous species should be watched closely in future readings.

TREND ASSESSMENT

soil - slightly down (2)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --

Herd unit 06 , Study no: 7

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
G	Agropyron dasystachyum	_a 26	_c 268	_b 126	_b 100	11	89	40	32	3.48	2.92
G	Agropyron spicatum	_b 244	_a 21	_b 147	_b 133	83	11	48	51	4.57	5.35
G	Bromus japonicus (a)	-	-	-	10	-	-	-	4	-	.04
G	Bromus tectorum (a)	-	-	57	40	-	-	24	21	.22	.15
G	Carex spp.	19	12	8	6	7	6	3	3	.16	.08
G	Elymus cinereus	-	-	-	1	-	-	-	1	-	.03
G	Oryzopsis hymenoides	53	53	72	49	23	26	29	26	1.62	1.81
G	Poa pratensis	-	-	1	5	-	-	1	2	.00	.06
G	Poa secunda	4	6	20	13	2	3	7	6	.18	.03
G	Sitanion hystrix	-	3	4	3	-	2	1	1	.00	.03
G	Stipa comata	_a 1	_{ab} 10	_{ab} 8	_b 15	1	5	3	6	.45	.64
Total for Annual Grasses		0	0	57	50	0	0	24	25	0.21	0.20
Total for Perennial Grasses		347	373	386	325	127	142	132	128	10.48	10.97
Total for Grasses		347	373	443	375	127	142	156	153	10.70	11.17
F	Achillea millefolium	-	-	4	1	-	-	2	1	.03	.03
F	Alyssum alyssoides (a)	-	-	215	182	-	-	71	59	1.00	.84
F	Arabis spp.	-	-	-	1	-	-	-	1	-	.00
F	Aster chilensis	_a -	_a -	_b 32	_b 36	-	-	11	14	.52	.48
F	Astragalus spp.	-	3	-	-	-	1	-	-	-	-

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
F	Balsamorhiza sagittata	3	3	5	2	1	1	2	1	.06	.03
F	Camelina microcarpa (a)	-	-	-	1	-	-	-	1	-	.00
F	Calochortus nuttallii	-	-	-	5	-	-	-	3	-	.18
F	Chaenactis douglasii	4	11	13	5	2	6	7	4	.08	.04
F	Cirsium undulatum	_a 9	_a 5	_{ab} 22	_b 27	6	4	11	18	.63	.90
F	Collomia linearis (a)	-	-	-	3	-	-	-	1	-	.00
F	Comandra pallida	28	12	28	25	11	6	13	15	.19	.22
F	Cryptantha spp.	_a 19	_b 34	_a 22	_{ab} 30	9	21	10	12	.27	.50
F	Descurainia pinnata (a)	-	-	1	-	-	-	1	-	.00	-
F	Epilobium brachycarpum (a)	-	-	1	-	-	-	1	-	.00	-
F	Eriogonum umbellatum	-	3	-	-	-	1	-	-	-	-
F	Hackelia patens	_b 32	_a 10	_{ab} 21	_a 8	16	6	11	3	.20	.04
F	Lactuca serriola	-	-	1	-	-	-	1	-	.00	-
F	Oenothera caespitosa	-	-	-	1	-	-	-	1	-	.03
F	Penstemon humilis	11	6	9	15	7	4	4	8	.09	.18
F	Ranunculus testiculatus (a)	-	-	_a -	_b 14	-	-	-	5	-	.02
F	Smilacina racemosa amplexicaulis	-	-	6	3	-	-	4	1	.07	.03
F	Tragopogon dubius	2	-	4	-	1	-	3	-	.06	-
F	Unknown forb-perennial	3	-	-	-	1	-	-	-	-	-
Total for Annual Forbs		0	0	217	200	0	0	73	66	1.01	0.88
Total for Perennial Forbs		111	87	167	159	54	50	79	82	2.24	2.71
Total for Forbs		111	87	384	359	54	50	152	148	3.25	3.59

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 06 , Study no: 7

T y p e	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	Amelanchier alnifolia	22	25	1.68	1.17
B	Artemisia tridentata vaseyana	13	11	.94	.56
B	Cercocarpus montanus	38	38	5.02	4.66
B	Chrysothamnus viscidiflorus viscidiflorus	20	23	.74	1.50
B	Gutierrezia sarothrae	82	77	4.02	3.67
B	Juniperus osteosperma	2	6	2.39	3.37
B	Opuntia spp.	10	7	.51	.45
B	Purshia tridentata	1	1	.63	.38
B	Quercus gambelii	6	8	2.65	1.66
B	Rosa woodsii	0	1	.15	-
B	Symphoricarpos oreophilus	19	19	2.75	3.59
B	Tetradymia canescens	4	3	.18	.38
Total for Browse		217	219	21.69	21.43

CANOPY COVER --

Herd unit 06 , Study no: 7

Species	Percent Cover	
	'96	'01
Juniperus osteosperma	7	7
Quercus gambelii	1	3

BASIC COVER --

Herd unit 06 , Study no: 7

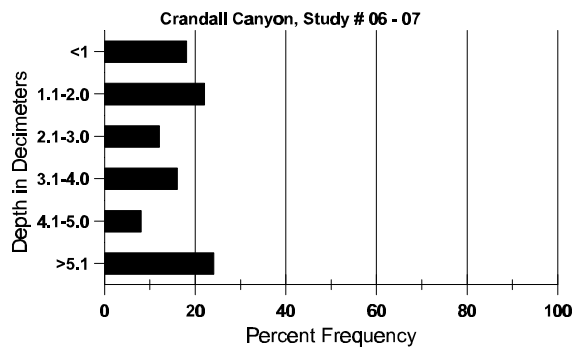
Cover Type	Nested Frequency		Average Cover %			
	'96	'01	'84	'90	'96	'01
Vegetation	353	330	4.50	9.50	34.75	37.41
Rock	153	147	2.75	4.75	3.69	3.95
Pavement	229	268	11.25	7.25	5.34	4.38
Litter	388	347	46.50	37.00	38.81	26.92
Cryptogams	3	-	.25	0	.03	0
Bare Ground	311	314	34.75	41.50	31.27	41.62

SOIL ANALYSIS DATA --

Herd Unit 06, Study no: 07, Crandall Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
15.8	68.0 (14.8)	8.0	58.7	12.0	29.3	1.7	5.1	32.0	.5

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 06 , Study no: 7

Type	Quadrat Frequency	
	'96	'01
Rabbit	-	11
Elk	5	2
Deer	15	22
Cattle	-	1

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'01	'01
252	N/A
26	2 (5)
644	50 (122)
78	7 (16)

BROWSE CHARACTERISTICS --

Herd unit 06 , Study no: 7

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Amelanchier alnifolia																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	2	-	3	-	-	3	-	-	8	-	-	-	533		8	
	96	4	-	1	-	1	-	-	-	-	6	-	-	-	120		6	
	01	4	1	1	2	-	-	-	-	-	8	-	-	-	160		8	
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	96	1	3	4	11	1	-	-	-	-	16	-	4	-	400	21	20	
	01	4	4	6	-	2	2	2	-	-	20	-	-	-	400	22	20	
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	1	3	-	1	-	2	2	-	4	-	-	5	600		9	
	96	-	-	1	1	1	-	-	-	-	3	-	-	-	60		3	
	01	-	2	1	-	-	1	-	-	-	1	-	1	2	80		4	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		24%			18%			29%			-49%							
'96		21%			21%			14%			+ 9%							
'01		28%			34%			09%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	0%			
												'90	1133		53%			
												'96	580		10%			
												'01	640		13%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Artemisia tridentata vaseyana																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	1	-	-	-	-	-	-	-	-	-	-	-	-	66		1	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	84	-	1	-	-	-	-	-	-	-	1	-	-	-	66		1	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	3	-	1	-	-	-	-	-	-	4	-	-	-	80		4	
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	84	1	4	1	-	-	-	-	-	-	6	-	-	-	400	20	23	6
	90	-	1	4	-	-	-	-	-	-	5	-	-	-	333	19	23	5
	96	2	4	5	1	-	-	-	-	-	12	-	-	-	240	14	25	12
	01	2	4	3	-	-	-	-	-	-	9	-	-	-	180	16	26	9
D	84	-	3	3	-	-	-	-	-	-	6	-	-	-	400		6	
	90	5	1	6	-	-	-	-	-	-	5	-	3	4	800		12	
	96	-	-	1	-	-	-	-	-	-	1	-	-	-	20		1	
	01	-	1	3	-	-	-	-	-	-	4	-	-	-	80		4	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	140		7	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		62%			31%			00%			+24%							
'90		12%			59%			41%			-70%							
'96		24%			41%			00%			-18%							
'01		36%			43%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	866	Dec:	46%			
												'90	1133		71%			
												'96	340		6%			
												'01	280		29%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	84	-	2	-	-	-	-	-	-	-	2	-	-	-	133		2	
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	96	5	6	-	-	-	-	-	-	-	11	-	-	-	220		11	
	01	-	-	2	-	-	-	-	-	-	2	-	-	-	40		2	
M	84	-	-	9	-	-	-	-	-	-	9	-	-	-	600	17 18	9	
	90	-	1	-	-	-	-	-	-	-	1	-	-	-	66	6 10	1	
	96	1	2	24	9	7	-	-	-	-	42	-	1	-	860	21 29	43	
	01	1	3	26	1	1	15	-	-	-	47	-	-	-	940	26 35	47	
D	84	-	1	8	-	-	-	-	-	-	9	-	-	-	600		9	
	90	-	1	11	-	-	2	-	-	-	9	-	1	4	933		14	
	96	-	-	-	2	-	-	-	-	-	2	-	-	-	40		2	
	01	6	-	1	-	-	4	-	-	-	3	-	-	8	220		11	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		15%			85%			00%			-20%							
'90		13%			81%			31%			+ 5%							
'96		27%			43%			02%			+ 7%							
'01		07%			80%			13%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	1333	Dec:	45%			
												'90	1065		88%			
												'96	1120		4%			
												'01	1200		18%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Chrysothamnus viscidiflorus viscidiflorus																	
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	90	21	-	-	-	-	-	-	-	-	19	-	2	-	1400		21
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
	90	44	2	-	1	-	-	-	-	-	23	-	24	-	3133	9	47
	96	42	1	1	4	-	-	-	-	-	48	-	-	-	960	10	48
	01	79	-	-	-	-	-	-	-	-	79	-	-	-	1580	8	79
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	90	9	13	-	-	-	-	4	-	-	12	-	3	11	1733		26
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
		'84			00%			00%									
		'90			16%			00%			-84%						
		'96			02%			02%			+38%						
		'01			00%			00%									
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	0%		
												'90	6266		28%		
												'96	1020		4%		
												'01	1640		0%		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	35	-	-	-	-	-	-	-	-	-	-	-	-	2333		35	
	96	31	-	-	-	-	-	-	-	-	-	-	-	-	620		31	
	01	1	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	36	-	-	7	-	-	-	-	-	43	-	-	-	2866		43	
	96	41	-	-	-	-	-	-	-	-	41	-	-	-	820		41	
	01	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
M	84	66	1	-	-	-	-	-	-	-	67	-	-	-	4466	11	13	67
	90	63	-	-	1	-	-	1	-	-	63	-	2	-	4333	8	7	65
	96	341	-	-	-	-	-	-	-	-	341	-	-	-	6820	9	11	341
	01	488	-	-	-	-	-	-	-	-	488	-	-	-	9760	6	8	488
D	84	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	90	12	-	-	-	-	-	-	-	-	10	-	-	2	800		12	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	37	-	-	-	-	-	-	-	-	15	-	3	19	740		37	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	520		26	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		01%			00%			00%			+43%							
'90		00%			00%			03%			- 4%							
'96		00%			00%			00%			+28%							
'01		00%			00%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	4599	Dec:	3%			
												'90	7999		10%			
												'96	7640		0%			
												'01	10680		7%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Juniperus osteosperma																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	01	5	-	-	-	-	-	-	1	-	6	-	-	-	120	-	6	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		00%			00%			00%										
'96		00%			00%			00%			+67%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	-			
												'90	0		-			
												'96	40		-			
												'01	120		-			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total									
		1	2	3	4		1	2										
Opuntia spp.																		
S	84	-	-	-	-	-	-	-	-	-	-	0			0			
	90	-	-	-	-	-	-	-	-	-	-	0			0			
	96	-	-	-	-	-	-	-	-	-	-	0			0			
	01	1	-	-	-	-	-	-	-	-	-	20			1			
Y	84	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	84	3	-	-	-	-	-	-	-	-	3	-	-	-	200	10	7	3
	90	2	-	-	-	-	-	-	-	-	2	-	-	-	133	6	6	2
	96	15	-	-	1	-	-	-	-	-	16	-	-	-	320	5	15	16
	01	9	-	-	-	-	-	-	-	-	9	-	-	-	180	4	9	9
D	84	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	6	-	-	-	-	-	-	-	-	2	-	-	4	120			6
% Plants Showing																		
<div>Moderate UseHeavy UsePoor Vigor%Change</div>																		
<div>'8400%00%00%-50%</div>																		
<div>'9000%00%00%+48%</div>																		
<div>'9600%00%00%-21%</div>																		
<div>'0100%00%27%</div>																		
Total Plants/Acre (excluding Dead & Seedlings)																		
<div>'84399Dec:17%</div>																		
<div>'901990%</div>																		
<div>'963800%</div>																		
<div>'0130040%</div>																		
Purshia tridentata																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	1	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60	14	51	3
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing																		
<div>Moderate UseHeavy UsePoor Vigor%Change</div>																		
<div>'8400%00%00%</div>																		
<div>'9000%00%00%</div>																		
<div>'9650%00%00%+33%</div>																		
<div>'0100%00%00%</div>																		
Total Plants/Acre (excluding Dead & Seedlings)																		
<div>'840Dec:0%</div>																		
<div>'9000%</div>																		
<div>'964050%</div>																		
<div>'01600%</div>																		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Quercus gambelii																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	90	9	-	-	1	-	-	-	-	-	10	-	-	666			10	
	96	3	-	-	-	-	-	-	-	-	3	-	-	60			3	
	01	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
Y	84	8	2	1	-	-	-	-	-	-	11	-	-	733			11	
	90	33	13	1	1	-	-	-	-	-	43	-	5	3200			48	
	96	6	-	-	-	-	-	-	-	-	6	-	-	120			6	
	01	6	-	-	11	-	-	-	-	-	17	-	-	340			17	
M	84	-	6	11	-	-	2	-	-	-	19	-	-	1266	30	19	19	
	90	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	96	28	-	-	2	-	-	-	-	-	30	-	-	600	28	18	30	
	01	23	-	-	23	-	-	3	-	-	49	-	-	980	47	24	49	
D	84	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	90	11	4	3	-	-	-	-	-	-	11	-	6	1200			18	
	96	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	80			4	
%		Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>				<u>%Change</u>						
		'84		27%		47%		00%				+55%						
		'90		26%		06%		18%				-84%						
		'96		00%		00%		00%				+45%						
		'01		00%		00%		00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	1999	Dec:	0%			
												'90	4400		27%			
												'96	720		0%			
												'01	1320		0%			
Rosa woodsii																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	0	16	10	0	
	01	2	-	-	-	-	-	-	-	-	2	-	-	40	9	6	2	
%		Plants Showing		<u>Moderate Use</u>		<u>Heavy Use</u>		<u>Poor Vigor</u>				<u>%Change</u>						
		'84		00%		00%		00%										
		'90		00%		00%		00%										
		'96		00%		00%		00%										
		'01		00%		00%		00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	-			
												'90	0		-			
												'96	0		-			
												'01	40		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	1	-	-	-	-	1	-	-	2	-	-	-	133		2	
	96	14	-	-	3	-	-	-	-	-	17	-	-	-	340		17	
	01	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	96	5	12	1	7	1	-	-	-	-	26	-	-	-	520	16	26	
	01	13	-	-	6	-	-	3	-	-	22	-	-	-	440	18	29	
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	2	6	1	1	-	-	1	-	-	3	-	-	8	733		11	
	96	1	2	-	1	-	-	-	-	-	3	-	-	1	80		4	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		54%			08%			62%			+ 8%							
'96		32%			02%			02%			-40%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	0%			
												'90	866		85%			
												'96	940		9%			
												'01	560		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Tetradymia canescens																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	1	-	-	-	-	-	-	-	-	1	-	-	20			1
	01	1	-	-	-	-	-	-	-	-	-	1	-	-	20			1
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	1	8	-	-	-	-	-	-	-	-	9	-	-	180	15	18	9
	01	3	-	-	1	-	-	-	-	-	-	4	-	-	80	10	15	4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		00%			00%			00%										
'96		90%			00%			00%			-50%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)													'84	0	Dec:	-		
													'90	0		-		
													'96	200		-		
													'01	100		-		